Indiana Vehicle Inspection and Maintenance Program Report 1997 - 2000

Produced by the Indiana Department of Environmental Management
Office of Air Quality
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EXECUTIVE SUMMARY

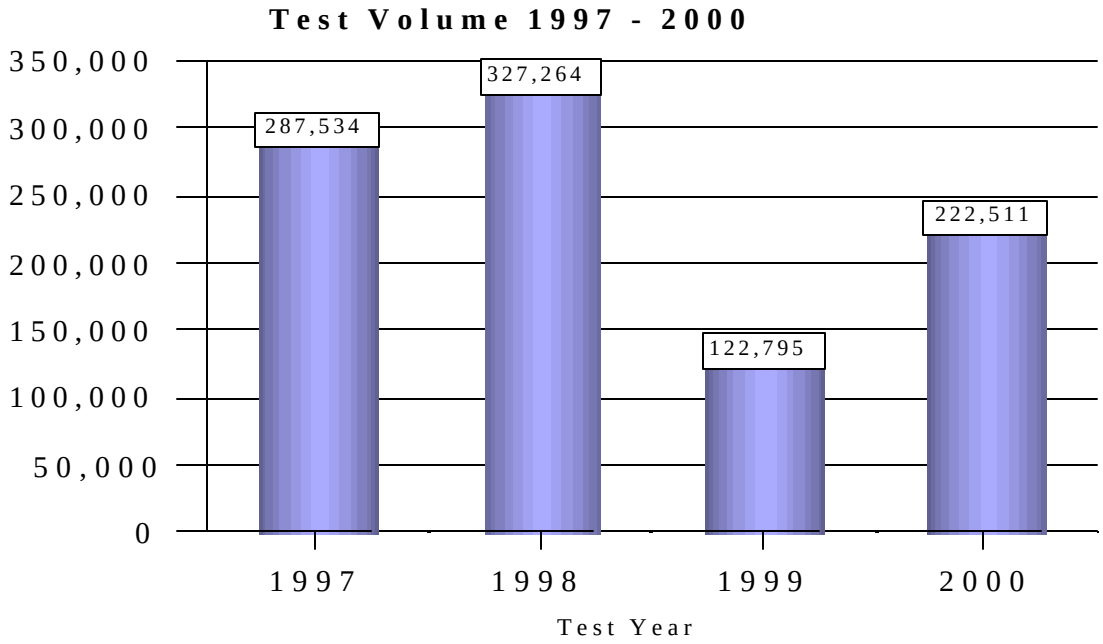
This report provides information about Indiana's Vehicle Inspection and Maintenance Program (I/M) from 1997 through 2000. IDEM implemented the Inspection and Maintenance program in Northwest and Southern Indiana in June 1984 to fulfill the requirements of the Clean Air Act. The Clean Air Act mandates I/M programs for areas that do not meet the one-hour health standard for ozone. The purpose of the program is to reduce vehicle emissions that cause ozone.

Information and data in this report include details about how the program is administered and operated, which vehicles are tested, how the testing is completed and what benefits to air quality have resulted from Indiana's Vehicle Inspection and Maintenance program. This report covers two complete testing cycles which is equivalent to four years of testing.

The overall testing volume in 1997 was 287,534 vehicles and 327,264 in 1998. These numbers show an increase of approximately 12% in the total number of tests in the two-year period. However, in 1999, only 122,795 vehicles were tested. This is a decrease of approximately 62% in the number of vehicles tested. This decrease is a direct result of a rule change that exempts vehicles in the most current four model years from emission testing and changes the determination for when a vehicle needs to be tested. However, in 2000, the overall testing volume increased to 222,511 vehicles, which shows a return to more typical numbers.

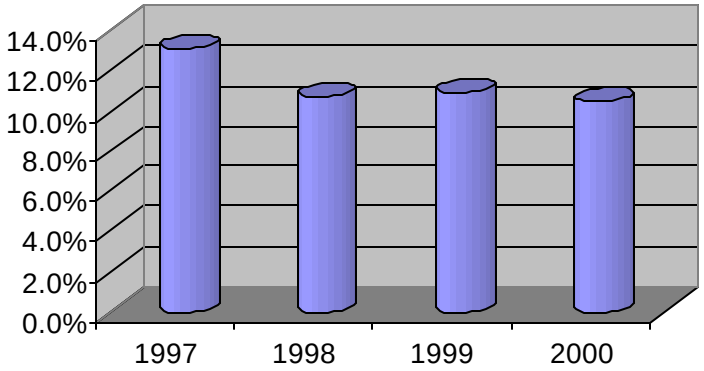
The test site with the highest annual average number of tests per site is the Griffith site with an average of 51,757 tests per year. Per lane average was highest at Hammond with an annual average of 13,136 tests per lane.

The graph below illustrates the test volume for 1997-2000 in Lake, Porter, Clark and floyd counties.

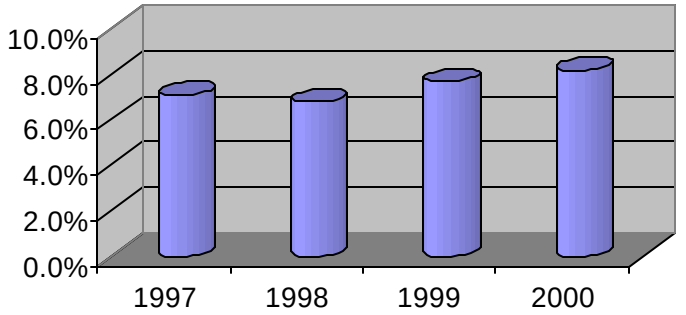


The graphs on this page illustrate the rate of failure for all vehicles tested in Lake, Porter, Clark and Floyd counties. Vehicles fail because their emissions are higher than the standards allow or the vehicle is tampered or has a leaking or damaged gas cap.

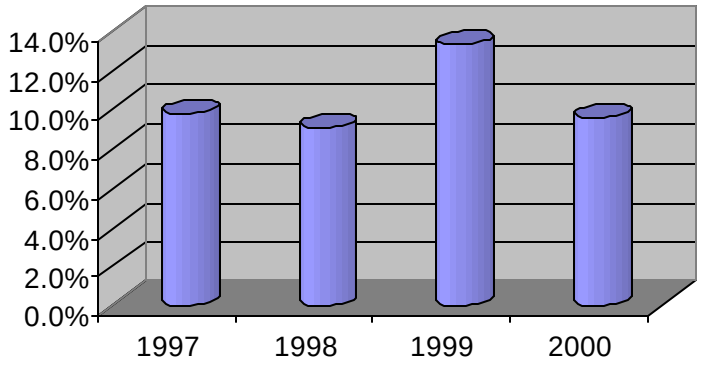
Initial Failure Rate for Passenger Vehicles by Test Year



Initial Failure Rate for Light Duty Trucks by Test Year



Initial Failure Rate for Heavy Duty Trucks by Test Year



As a result of repairs made to vehicles that initially failed and subsequently passed the emissions test, there was an overall emission reduction in 1997 of 9% to 11% in hydrocarbons and an 11% to 15% overall emission reduction in carbon monoxide. In 1999, there was an overall emission reduction of 8% to 9% in hydrocarbons and a 13% overall emission reduction in carbon monoxide. The average repair cost per vehicle was $229.68.

Minimum Expenditure Waivers are available for vehicles where needed repairs would cost more than $450.00 for model years 1981 and newer and $75.00 for model years 1976-1980 in Northwest Indiana. In Southern Indiana, waivers are available for repairs over $200.00 for model years 1981 and newer and $75.00 for model years 1976 - 1980. Waivers are valid for two years. After two years a vehicle that has received a waiver must show compliance or it cannot be registered in an I/M county.

The percentage of vehicles receiving minimum expenditure waivers declined over the four-year period, 1997 to 2000. In 1997, 653 minimum expenditure waivers or 2.2% of initial failures were issued; in 1998, 435 minimum expenditure waivers or 1.5% of initial failures were issued; in 1999, 104 minimum expenditure waivers or 0.95% of initial failures were issued; in 2000, 164 minimum expenditure waivers or 0.82% of initial failures were issued.

Waivers for all vehicle classes in 1997:

Automobiles (LDV)	580
Light Duty Trucks 1 (LDT1)	42
Light Duty Trucks 2 (LDT2)	31
Heavy Duty Trucks (HDT)	0

Waivers for all vehicle classes in 1998:

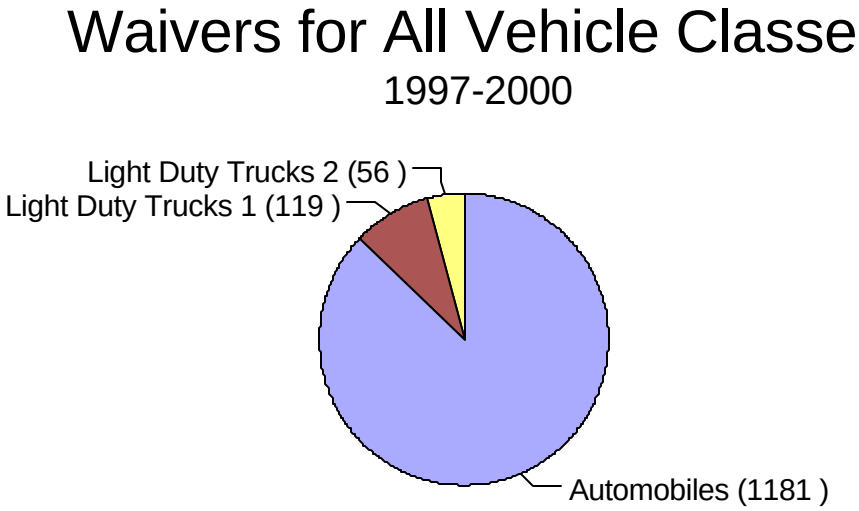
Automobiles (LDV)	372
Light Duty Trucks 1 (LDT1)	45
Light Duty Trucks 2 (LDT2)	18
Heavy Duty Trucks (HDT)	0

Waivers for all vehicle classes in 1999:

Automobiles (LDV)	91
Light Duty Trucks 1 (LDT1)	11
Light Duty Trucks 2 (LDT2)	2
Heavy Duty Trucks (HDT)	0

Waivers for all vehicle classes in 2000:

Automobiles (LDV)	138
Light Duty Trucks 1 (LDT1)	21
Light Duty Trucks 2 (LDT2)	5
Heavy Duty Trucks (HDT)	0



BACKGROUND

History

Indiana's Vehicle Inspection and Maintenance (I/M) programs are located in Northwest Indiana in Lake and Porter counties and Southern Indiana in Clark and Floyd counties. The programs are designed to help these areas meet ozone health standards by reducing ozone contributing emissions from vehicles registered in those counties.

Ground level ozone is an air pollutant that causes shortness of breath, coughing, wheezing, and eye and nose irritation. It is especially dangerous to older adults, children, asthmatics, and persons with chronic respiratory ailments. Even healthy people can suffer lung damage as a result of ground level ozone pollution.

Ground level ozone is formed when oxides of nitrogen (NOx) and volatile organic compounds (VOCs) or hydrocarbons (HC) are combined in the presence of sunlight. Motor vehicles emit both HC and NOx.

The federal Clean Air Act sets health standards for ozone. Counties that do not meet the health standards are designated nonattainment. Nonattainment counties are required to reduce emissions that cause ozone and come into attainment with the standards over a period of time.

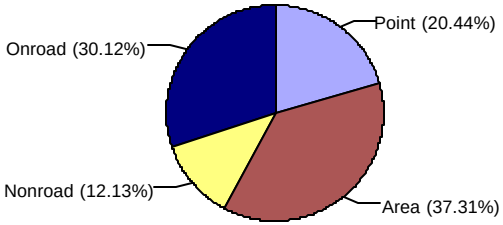
Lake, Porter, Clark and Floyd counties in Indiana were designated nonattainment. The Clean Air Act requires Vehicle Inspection and Maintenance programs to be implemented in those areas to help the counties meet the standard. In 1990, Congress required that existing I/M programs be upgraded to use a test that more accurately measures emissions of vehicles on the road. Air quality in both areas has improved (Clark and Floyd counties now are in attainment with the one hour standard) and the I/M programs are necesssary to help maintain improved air quality.

Eliminating ground level ozone is one part of an overall plan to improve air quality in the United States. The I/M programs are not the only programs working to reduce ozone contributing emissions. Federal rules require that all gasoline powered, on-road engines produced for use in the United States meet specific minimum emissions standards for hydrocarbons (HC), carbon monoxide (CO) and oxides of nitrogen (NOx) as they come off the assembly line. However, maintenance is required to keep a vehicle meeting the emission standards for its particular make and model year.

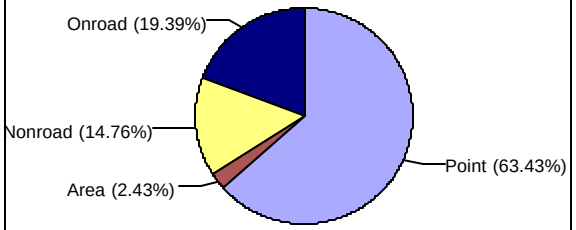
Over time, engines will suffer deterioration from use. In order for engines to keep operating efficiently to meet original standards after they have been in use, proper maintenance and periodic inspection are necessary. The I/M programs mandated for specific non-attainment areas such as Lake, Porter, Clark and Floyd counties in Indiana are a way to ensure that vehicles have a regular emissions inspection. The "I" in I/M stands for inspection and means that a vehicle must be inspected or tested on a periodic schedule for excessive emissions using the appropriate testing method and standards for the particular vehicle. The "M" in I/M stands for maintenance required as a result of the inspection.

Northwest Indiana
1996 Emissions
Percent per Ozone Season

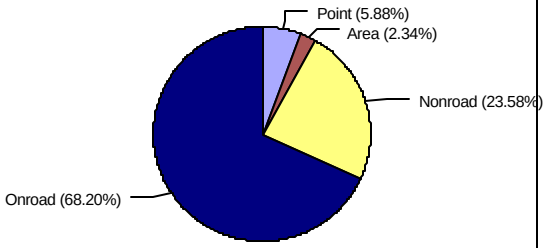
VOCs



NOx



CO



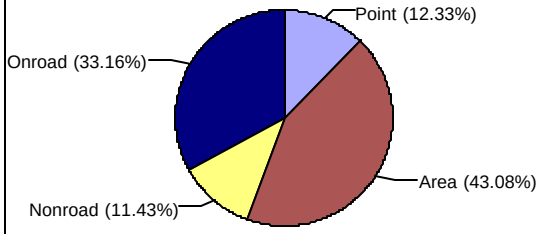
I/M and the Ozone Program

As illustrated in the charts on this page, mobile sources contribute significantly to the emissions that cause ground level ozone. More than 30 % of VOC emissions were emitted by mobile sources in Northwest and Southern Indiana in 1996.

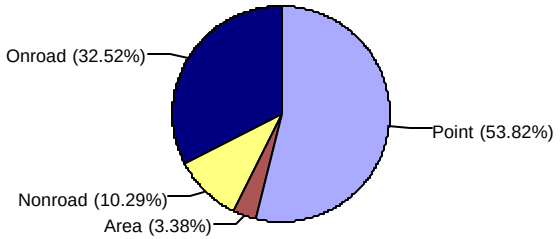
Indiana has adopted a number of control measures that apply to point, area, onroad and nonroad sources in order to improve air quality for its citizens. "Point" sources are large stationary sources, such as industrial facilities. "Area" sources are sources that cannot be defined by location, such as lawn mowing and use of consumer products or smaller businesses, such as gas stations. "Onroad" sources are vehicles that travel the roadways. Nonroad sources are vehicles used off road, such as construction equipment. The I/M program is part of Indiana's overall plan to improve air quality and reduce volatile organic compounds (VOCs) and oxides of nitrogen (NOx) in the state's non-attainment areas. This reduction is accomplished by requiring passenger cars and light and medium duty trucks with a gross vehicle weight rating (GVWR) of 9,000 pounds or less which are of model years 1976 and newer and are registered in the non-attainment counties to undergo emissions inspections every other year.

Southern Indiana
1996 Emissions
Percent per Ozone Season

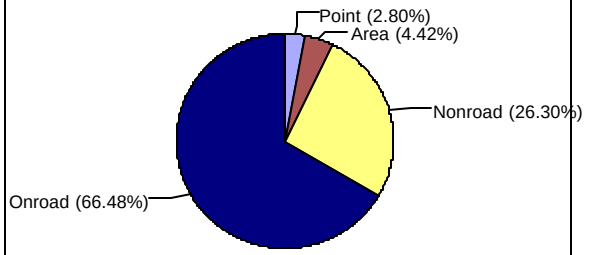
VOCs



NOx



CO



There is a large number of vehicles on the road in the Northwest Indiana and the greater Louisville area. These vehicles make a significant contribution to overall air quality, making the I/M program an important part of the state's ozone reduction program. Indiana's State Implementation Plan (SIP), a federally mandated plan to reduce emissions in nonattainment regions, depends on the I/M program to achieve 6800 pounds per day of VOC reductions in Lake and Porter counties and 2200 pounds per day of VOC reductions in Clark and Floyd counties. Without the I/M program, these reductions would have to come from other sources, which are already required to meet reduction goals through the state's permitting process and other federal and state mandates. IDEM has a statewide NOx reduction requirement for utilities and large industry. Indiana has state rules that mandate VOC control measures for large and small businesses and other area sources. There are also federal standards to help achieve mobile source reductions, such as fuel standards, engine standards and vapor recovery at fueling stations. Voluntary programs throughout the state help residents take an active role in reducing ozone. There are many programs working together to reduce ozone in Northwest Indiana and the greater Louisville area.

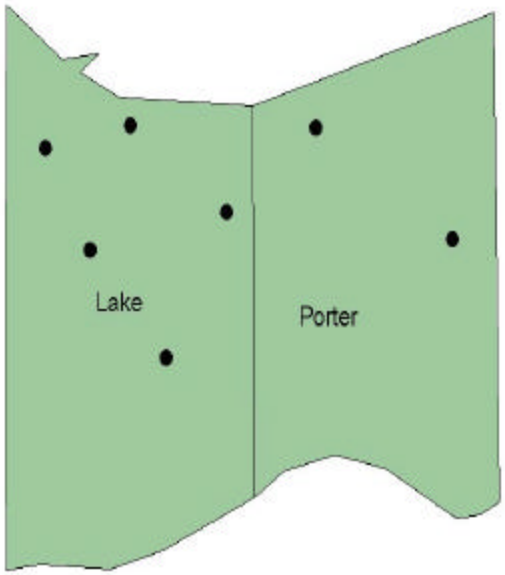
The U.S. Environmental Protection Agency (U.S. EPA) issued regulations specifying the requirements of an "enhanced" vehicle inspection program. The Indiana General Assembly adopted legislation in 1994 authorizing the Indiana Department of Environmental Management (IDEM) to contract for provision of an enhanced vehicle inspection program. The Indiana Air Pollution Control Board adopted new rules in 1995 and revised them in 1998 for the enhanced emissions inspection program, which is called Clean Air Car Check. This program has become a vital part of the state's overall ozone reduction program.

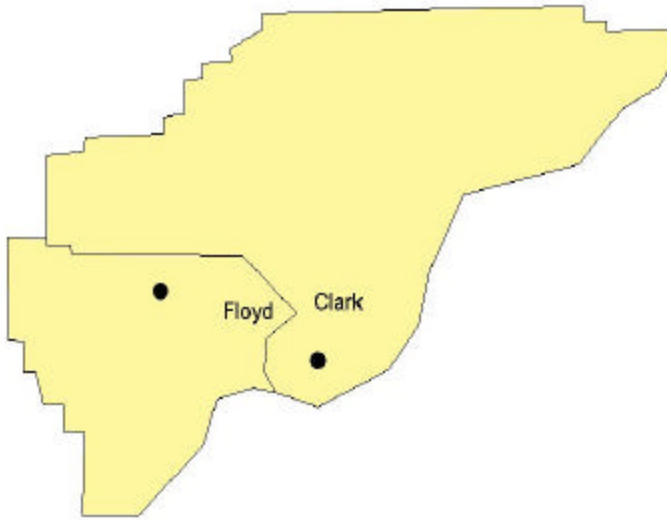
BEGINNING OF THE PROGRAM

Indiana's initial basic emissions testing program operated from June 1984 until December 1996. IDEM had a contract with Indiana Vocational Technical College (IVY Tech) to perform the testing. IVY Tech operated three test stations in Lake County, two in Porter County, and one in southern Indiana. IVY Tech also operated two mobile emission testing units, one in northwest Indiana and one in southern Indiana. In 1984, the program was a centralized program with a one-speed idle test. The vehicle was driven onto the test station floor and a probe was used to measure emissions from the exhaust at idle speed. In 1990, the test was upgraded to a two-speed idle test. The two-speed idle test measured the emissions at idle and at a fast idle.

IDEM began an enhanced emissions testing program called "Clean Air Car Check" in northwest Indiana in Lake and Porter counties on January 2, 1997. Enhanced emissions testing is an advanced testing system that tests the vehicles on a dynamometer (a device that allows the vehicles wheels to turn while the vehicle remains stationary) at speeds up to 33 miles per hour. The enhanced program also tests the gas cap for leaks and failures. Testing on the dynamometer began in southern Indiana on July 1, 1997. The program began with five test sites in northwest Indiana and two test sites in southern Indiana, with a total of 22 test lanes.

Two additional sites were added in northwest Indiana; one in Gary, which opened on October 1, 1998, and one in Portage, which opened on July 1, 1999. The addition of these two test sites increased the total number of test sites to nine with a total number of test lanes of 27. The black dots on the maps below indicate the approximate locations of nine Clean Air Car Check stations. Seven stations are located in Lake and Porter counties, the other two are located in Clark and Floyd counties.





PROGRAM ADMINISTRA TION

Legal Authority

The statutory requirement for the Inspection and Maintenance (I/M) program is Indiana Code (IC) 13-17-5 “Motor Vehicle Emission Control”. 326 Indiana Administrative Code (IAC) 13-1.1 “Motor Vehicle Inspection and Maintenance (I/M) Requirements” is the state environmental rule that addresses implementation of the program. 326 IAC 13-1.1-2 through 13-1.1-7 define the applicability criteria for vehicles to be tested, the general requirements for the program, the network type and the test parameters (see Appendix). There is no statutory authority for a test fee to the motorist, so testing is free.

Contract and Budget

The Indiana Department of Environmental Management (IDEM) oversees the operation of the I/M program as mandated by the Clean Air Act Amendments. IDEM has a ten year contract with Envirotest Systems, to operate Indiana’s nine Clean Air Car Check stations. A ten year contract allowed Indiana to spread the capital cost of building and equipping the test sites over a longer period of time. Funding for the implementation and first three years of operation came from a combination of Indiana general revenues and federal transportation clean air dollars. Currently, the program is funded by state general revenues. The contract total for 2002 is $7.5 million. The contract extends through 2006; the contract total for the last year is $7.7 million. The funds are paid to Envirotest Systems, by IDEM. Envirotest Systems uses the funds to provide operation and maintenance of the nine test stations. Envirotest Systems also is responsible for the program’s technical requirements, including emission inspection procedures and standards, performance standards for emission inspection equipment used in the program and training emission inspectors.

WHAT VEHICLES ARE CO VERED

Emission testing is required in Lake, Porter, Clark and Floyd counties. All light and medium duty gas-powered vehicles registered in those counties, which are model year 1976 or newer and are registered for highway use, are subject to emission testing. There are certain types of vehicles that are exempt from emission testing such as heavy-duty vehicles, farm vehicles, motorcycles, vehicles with engines with a displacement of less than 200 cubic centimeters, recreational vehicles, diesel engines, electric vehicles, and off-highway construction equipment. New vehicles are exempt from testing until four (4) calendar years after the model year of the vehicle.

Indiana's emission testing program uses registration denial as its enforcement mechanism. Motorists are notified when an emission test is due by a statement printed on the registration renewal form that is sent to motorists annually by the Bureau of Motor Vehicles. Vehicles are tested biennially according to the model year of the vehicle; that is, an even model year vehicle is tested in an even-numbered year and an odd model year vehicle is tested in an odd-numbered year. A vehicle may not be registered in Lake, Porter, Clark or Floyd counties unless the vehicle complies with the program requirements.

In order to register a vehicle, a valid Vehicle Inspection Report indicating that the vehicle passed the emission test, received a waiver or is exempt from the emission test must be presented at the time of registration. However, there are instances when a vehicle may not be available for inspection. In those cases, the Bureau of Motor Vehicles and IDEM provide reasonable exceptions to the inspection requirement. Vehicles that are not available to be tested because they are out of the state will be issued an Out of State Extension. This extension is available to students, military personnel, and others out of the state for business or personal reasons and is valid for one year. Additionally, a waiver may be issued to a vehicle that cannot be brought into compliance because of financial hardship of the motorist or when the repair costs are excessive. This waiver is good for two years and a vehicle may receive only one waiver in its lifetime. After the waiver expires, the vehicle cannot be registered in Lake, Porter, Clark or Floyd counties unless it passes the emissions test.

All light and medium duty gas-powered vehicles registered in Lake, Porter, Clark and Floyd counties, which are model year 1976 or newer and are registered for highway use, are subject to emission testing. New vehicles are exempt from testing until four (4) calendar years after the model year of the vehicle.

DESCRIPTION OF TESTING PROCEDURE

Step 1: A visual inspection of the vehicle is performed before the vehicle advances to the next step.

Step 2: The dynamometer test begins after the completion of Step 1.

Step 3: The final phase of the testing process is a review of the test results with the motorist.

The emission test is a simple three-step process. During the first step, an inspector completes a basic visual inspection of the vehicle to determine whether the vehicle can safely be tested. The inspector checks the vehicle for obvious fluid leaks, loose exhaust components, and tire condition. The driver then exits the vehicle and is directed to wait in the climate-controlled motorist's wait booth. The inspector verifies the presence of the catalytic converter and conducts a gas cap pressure check. If the gas cap fails the pressure test, at the Lake and Porter counties Clean Air Car Check stations, the inspector offers a free replacement cap, provided by the BP Whiting Refinery, a member of the Northwest Indiana Partners for Clean Air program. Partners for Clean Air is a coalition of business, industry and local organizations taking voluntary actions to reduce ozone. Prior to 2000, a bad gas cap would cause the vehicle to fail the emission test. The motorist was required to get a replacement cap and return for a retest.

In the second step of the test for model year vehicles 1981 and newer, the inspector secures the vehicle on a treadmill device called a dynamometer. During this portion of the test, the vehicle is accelerated, decelerated, braked, and "driven" at speeds up to 33 mph.

This procedure simulates real driving conditions and allows the vehicle to operate normally. All of the vehicle's tailpipe emsisions are collected as the vehicle "drives" on the dynamometer. This test measures the vehicle's hydrocarbon (HC) and carbon monoxide (CO) emissions to determine whether they are within test standards. The test also measures oxides of nitrogen (NO_x) emissions, for informational purposes only.

In the second step of the procedure for a vehicle that is model year 1976 through 1980, the inspector checks the vehicle's emissions while it is idling by use of a probe inserted into the tailpipe. This test also measures the HC and CO emissions to determine whether they are within the standards.

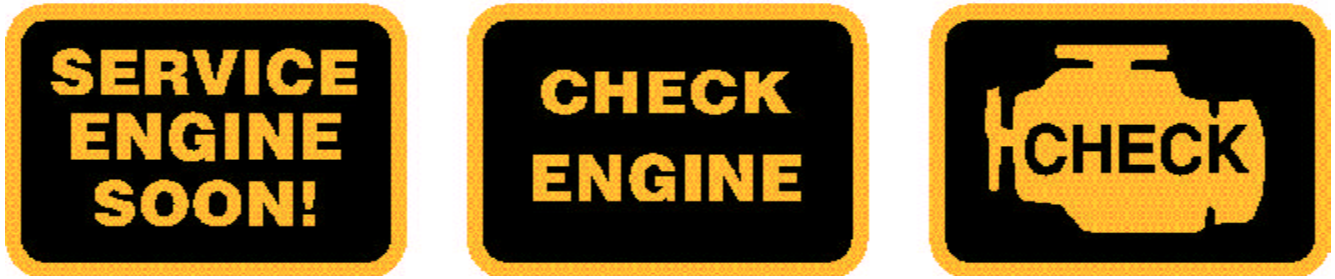
In the third step, the driver returns to the vehicle in the final lane position. The inspector presents the motorist with a Vehicle Inspection Report and other appropriate paperwork for his or her emission test.

If the vehicle fails the inspection, the inspector provides information about Indiana certified emission repair facilities. The vehicle owner must get the vehicle repaired and return it for a retest, before the vehicle can be registered. In the event a Vehicle Inspection Report is lost or damaged, a free duplicate is available at any of the emission test sites.

ON-BOARD DIAGNOSTICS

Model year vehicles 1996 and newer are required by federal law to be equipped with On-Board Diagnostics-Generation II (OBD II). OBD II is a computer system designed to provide early warning of potentially high emissions. The system recognizes malfunctions in the vehicle's operating systems that may cause higher than normal emissions from the engine tailpipe and fuel system. When a fault is identified by the diagnostic system, OBD II alerts the driver via a dash light, known as the Malfunction Indicator Lamp (MIL). Automobile manufacturers use a variety of warning lamps to notify drivers of different conditions. In the case of the OBD II, the phrase "Service Engine Soon" or "Check Engine" is used to notify the driver there is a potential pollution problem.

OBD II requires a different form of testing than vehicles without the system. Vehicles equipped with OBD II are not tested on the dynamometer. Instead, the vehicle's OBD II system is tested. The first and third steps of the testing process remain the same, the second step is different because the vehicle does not need to be driven on the dynamometer. The computer system is checked to determine whether it identified any faults that could cause high emissions. If the system detects a fault, the vehicle fails the inspection. The motorist is notified that the OBD II system detected a fault and is required to have the problem corrected.



"Service Engine Soon" or "Check Engine" is used to notify the driver there is a potential pollution problem.

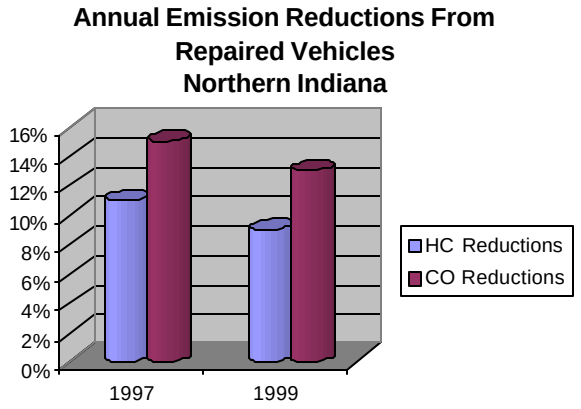
WHAT ARE THE BENEFIT S OF CLEAN AIR CAR CHECK?

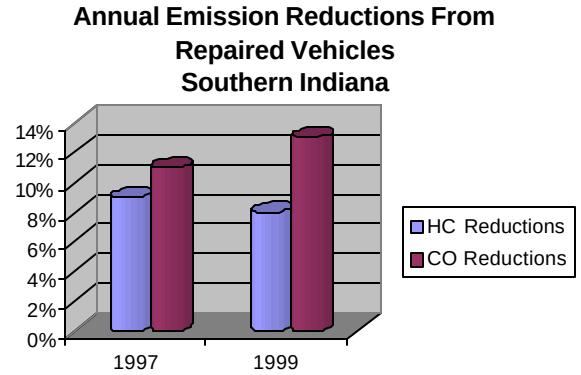
It is clear that the I/M program has contributed to improved air quality in Northwest and Southern Indiana. The benefits of this program combined with emission reductions from industry, improved fuel and vehicle standards and voluntary efforts have brought Clark and Floyd counties into compliance with the 1-hour health standard for ozone and have significant;y improved air quality in Lake and Porter counties.

The Clean Air Car Check identifies vehicles that emit more than federal standards permit. When these vehicles are repaired, the result is cleaner air. Some of the benefits from the Clean Air Car Check can be determined by looking at test results. This can be done by comparing initial test results (both pass and fail) to final test results (either pass or fail) during a testing year. For this report, we have used test results from 1997 and 1999. The testing years of 1997 and 1999 were used in order to see the same group of vehicles in two test cycles. Since Indiana tests odd-numbered model year vehicles in odd calendar years, vehicles tested in 1997 would be tested again in 1999. (Even-numbered model year vehicles were not considered in the emission reduction calculations.)

The charts on the right show the overall percentage reductions from enhanced I/M testing for a data set of vehicles tested in 1997 and again in 1999. These results are given as a percent reduction of the emissions of HC and CO. Vehicle initial test results (both pass and fail) for vehicles tested in 1997 were compared to final test results (either pass or fail). Overall emission reductions were more in 1997 than in the 1999 test year. This is expected as a result of the carryover benefit of tests from the previous test cycle.

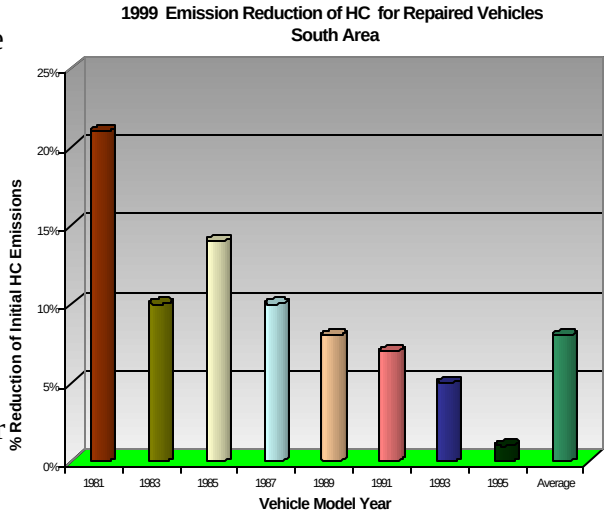
The charts on the right illustrate emission reductions for the same data set of vehicles by model year.

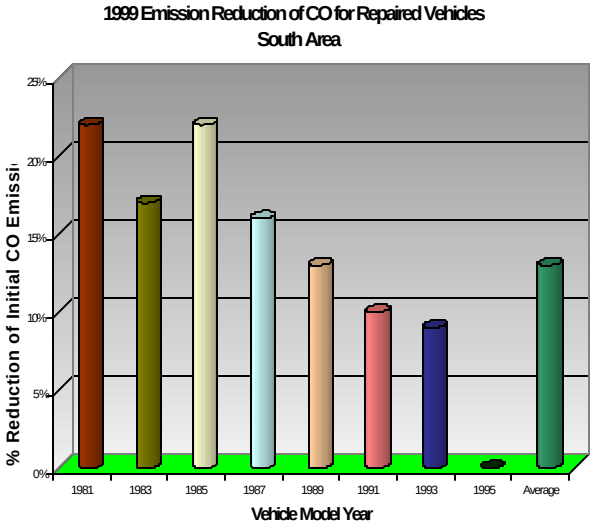


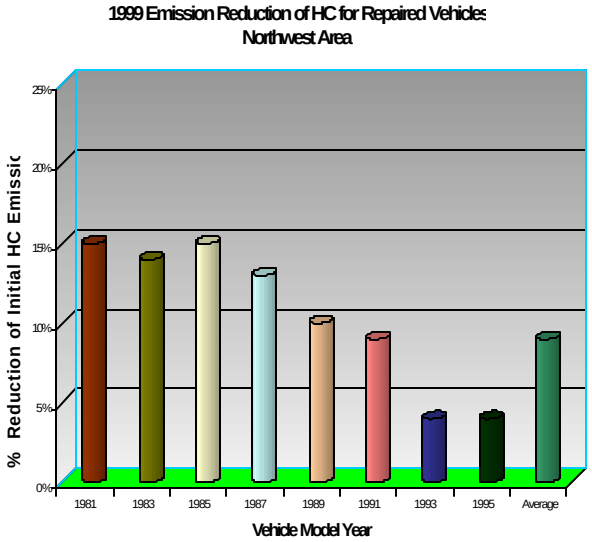


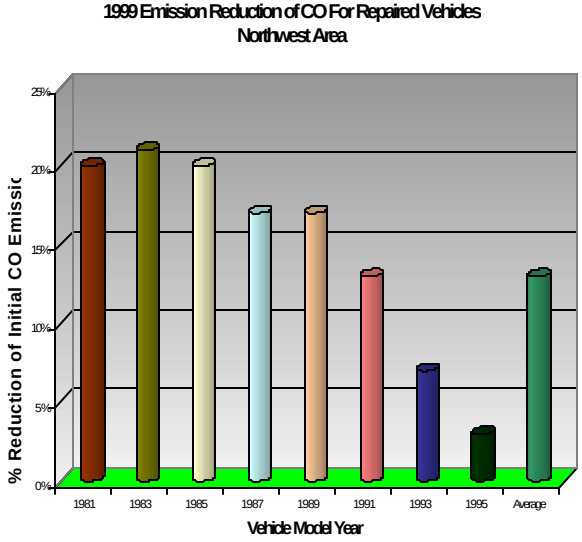
The charts on the right show the overall percentage reduction of HC and CO emissions that resulted from repairs that were required because the vehicles failed the Clean Air Car Check. Additional, unquantifiable reductions result from vehicles that are tuned up before the vehicle owner brings it in to be tested.

The data show that I/M is more effective on older vehicles. 1991 and older vehicles have higher emission reductions that can be attributed to increased effectiveness of I/M on vehicles with higher deterioration of emission controls. We would expect to see this trend in the 1981-1989 model years due to improved reduction technology introduced in 1991 model year vehicles.









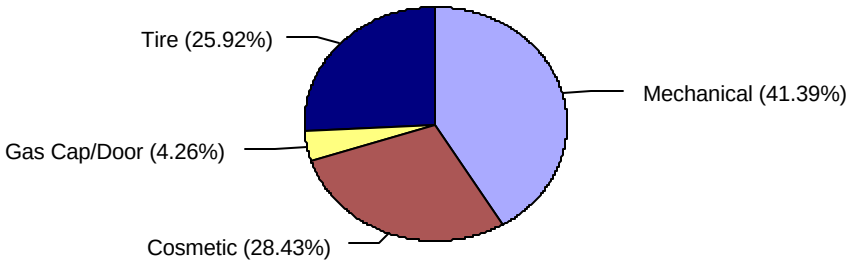
CUSTOMER SERVICE

Clean Air Car Check inspections are intended to be damage free. It is the Clean Air Car Check's goal to operate a damage free program. However, there are occasions when a vehicle may be damaged. If a customer is unhappy with the care their vehicle received, they may make a damage claim.

Damage claims are classified in five separate categories: Mechanical, cosmetic, gas cap/door, tire and miscellaneous. Mechanical damage includes damage to the motor, transmission, brakes and radiator. Cosmetic damage includes scratches, dents, and broken mirrors. Gas cap/door refers to damage incurred during the gas cap inspection. Tire damage includes scuffs and punctures. Miscellaneous damage covers all other claims.

If a motorist feels his or her vehicle has been damaged as a result of the testing procedure, a damage claim form may be filled out at the test station before the motorist leaves the Clean Air Car Check. Claims are evaluated and a cause is determined and agreed upon by the motorist and the Clean Air Car Check's manager. In many cases it is determined that the damage claimed was not caused by the test procedure, but existed prior to testing. From 1997 through 2000, 586 damage claims were filed; 212 were actually determined to be a result of the Clean Air Car Check procedure.

Damage Claims Filed 1997-2000



There are seven Clean Air Car Checks in northwest Indiana and two test stations in southern Indiana. Lanes are open 54 hours per week, testing on average 787 cars per day.

Operating Statistics Damage Claims 1997-2000

Total number of vehicles tested:	960,387
Total # of damage claims:	586 (.06%)
Average claim dollar amount:	$50.56

Damage claims continue to be on a downward trend. Indiana has the lowest damage claims in the midwest.

ANNUAL TESTING SUMMARY

All 1976 or newer, light and medium duty gas-powered vehicles registered for highway use in Lake, Porter, Clark and Floyd counties are subject to emissions testing.

Beginning in 1999, vehicles were tested biennially according to the model year of the vehicle. Even-numbered model year vehicles are tested in an even-numbered year; odd-numbered model year vehicles are tested in an odd-numbered year.

The chart below shows the initial testing volume for the years 1997, 1998, 1999 and 2000. There was an increase of approximately 12% in the total number of tests administered in the two-year period of 1997-1998. However, 1999 showed a 62% decrease in the number of vehicles tested. This decrease is a direct result of a rule change that exempted vehicles of the most current four (4) model years from emission testing and changed the determination of when a vehicle needs to be tested. The overall testing volume increased to more typical numbers in 2000.

	Tests	Pass	Fail	Failure Rate (%)
1997	251,289	221,984	29,305	11.66
1998	286,771	258,643	28,128	9.81
1999	106,947	96,026	10,921	10.21
2000	196,439	176,663	19,776	10.06

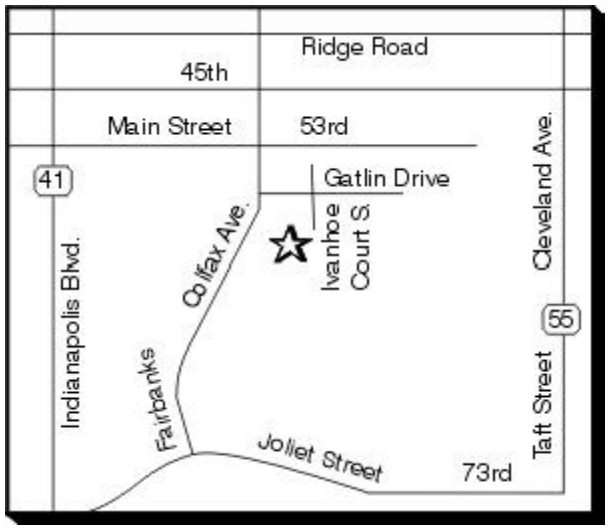
INDIVIDUAL SITE ANNUAL TESTING SUMMARY - NORTHWEST INDIANA

Hammond - 1231 Gostlin Street Initial Test Results 1997 - 2000				
	Tests	Pass	Failures	Failure Rate (%)
Hammond	133,157	115,594	17,563	13.2

Hammond - 1231 Gostlin Street Initial Test Failure Rate By Vehicle Model Year For Test Years 1997 - 2000			
Model Year	Initial Tests	Initial Failures	Failure Rate (%)
1976 - 1980	5,279	2,234	42.32
1981 - 1989	57,581	11,973	20.79
1990 - 1995	57,982	3,314	5.72
1996 and newer	12,575	88	0.70

Griffith - 232 Ivanhoe Court South
Initial Test Results
1997 - 2000

	Tests	Pass	Failures	Failure Rate (%)
Griffith	183,108	164,892	18,216	9.9

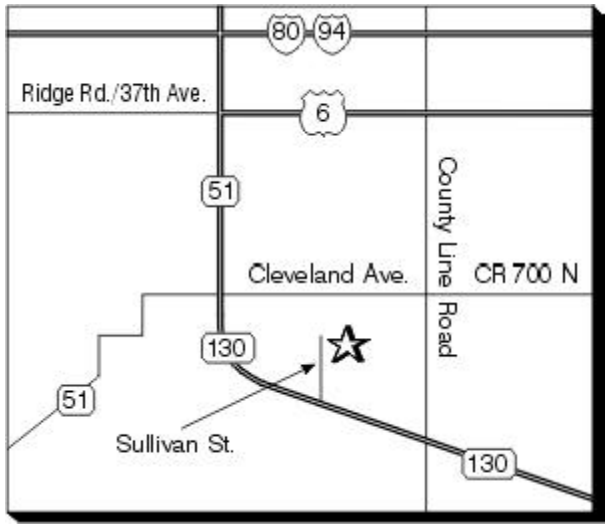


Griffith - 232 Ivanhoe Court South
Initial Test Failure Rate
By Vehicle Model Year
For Test Years 1997 - 2000

Model Year	Initial Tests	Initial Failures	Failure Rate (%)
1976 - 1980	5,351	2,245	41.95
1981 - 1989	65,868	11,980	18.19
1990 - 1995	89,850	3,815	4.25
1996 and newer	22,263	139	0.62

Hobart - 325 Sullivan Street
Initial Test Results
1997 - 2000

	Tests	Pass	Failures	Failure Rate (%)
Hobart	95,805	85,160	10,645	11.1



Hobart - 325 Sullivan Street
Inital Test Failure Rate
By Vehicle Model Year
For Test Years 1997 - 2000

Model Year	Initial Tests	Initial Failures	Failure Rate (%)
1976 - 1980	2,603	1,007	38.69
1981 - 1989	34,862	5,260	15.09
1990 - 1995	57,232	2,137	3.73
1996 and newer	15,357	121	0.79

Crown Point - 755 North Industrial Boulevard
Inital Test Results
1997 - 2000

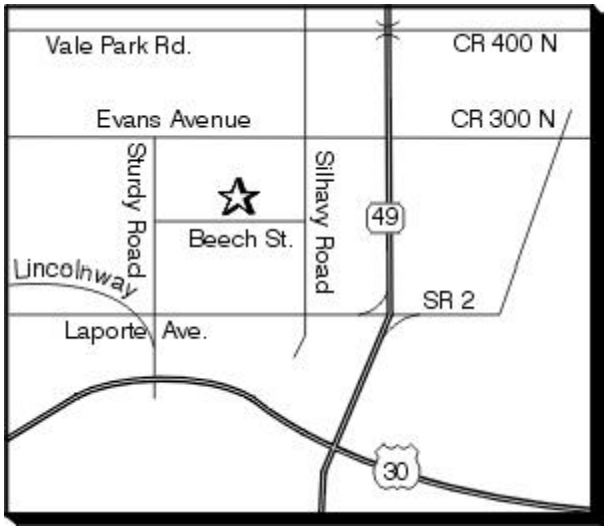
	Tests	Pass	Failures	Failure Rate (%)
Crown Point	109,823	101,308	8,515	7.8

Crown Point - 755 North Industrial Boulevard
Initial Test Failure Rate
By Vehicle Model Year
For Test Years 1997 - 2000

Model Year	Initial Tests	Initial Failures	Failure Rate (%)
1976 - 1980	3,494	1,493	42.73
1981 - 1989	37,250	7,039	18.90
1990 - 1995	44,756	2,079	4.65
1996 and newer	10,563	83	0.79

Valparaiso - 2503 Beech Street
Initial Test Results

	Tests	Pass	Failures	Failure Rate (%)
Valparaiso	110,006	101,901	8,105	7.4

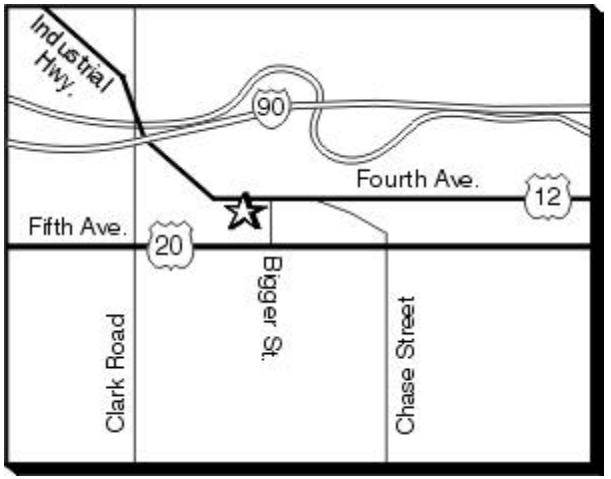


Valparaiso - 2503 Beech Street
Initial Test Failure Rate
By Vehicle Model Year
For Test Years 1997 - 2000

Model Year	Initial Tests	Initial Failures	Failure Rate (%)
1976 - 1980	2,487	956	38.44
1981 - 1989	33,706	4,991	14.81
1990 - 1995	58,592	2,106	3.59
1996 and newer	15,446	78	0.50

Gary - 3901 West Fourth Avenue
Initial Test Results
1997 - 2000

	Tests	Pass	Failures	Failure Rate (%)
Gary	27,182	22,542	4,640	17.1

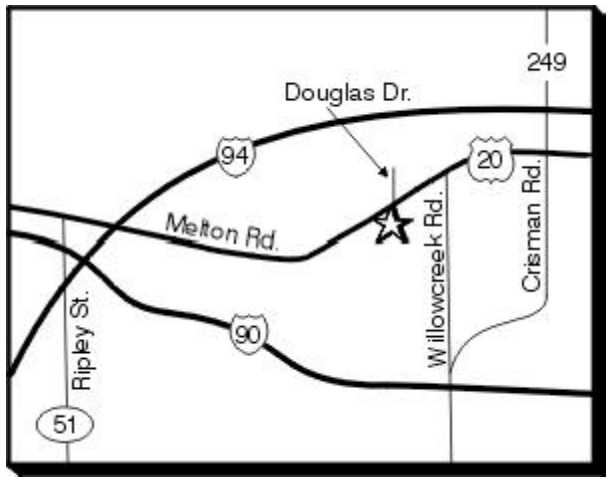


Gary - 3901 West Fourth Avenue
Initial Test Failure Rate
By Vehicle Model Year
For Test Years 1997 - 2000

Model Year	Initial Tests	Initial Failures	Failure Rate (%)
1976 - 1980	895	414	46.26
1981 - 1989	10,950	2,862	26.14
1990 - 1995	12,760	1,204	9.44
1996 and newer	2,627	52	1.98

Portage - 5777 Melton Road
Initial Test Results
1997 - 2000

	Tests	Pass	Failures	Failure Rate (%)
Portage	15,420	13,966	1,454	9.4



Portage - 5777 Melton Road
Initial Test Failure Rate
By Vehicle Model Year
For Test Years 1997 - 2000

Model Year	Initial Tests	Initial Failures	Failure Rate (%)
1976 - 1980	320	123	38.44
1981 - 1989	4,323	784	18.14
1990 - 1995	8,215	523	6.37
1996 and newer	2,581	26	1.01

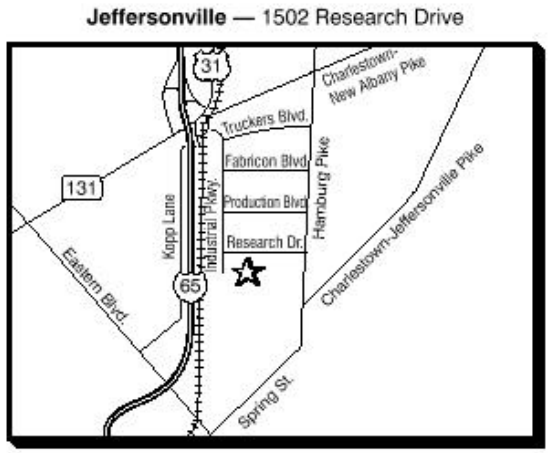
INDIVIDUAL SITE ANNUAL TESTING SUMMARY - SOUTHERN INDIANA

New Albany - 4109 Reas Lane Initial Test Results 1997 - 2000				
	Tests	Pass	Failures	Failure Rate (%)
New Albany	69,290	61,798	7,492	10.8

New Albany - 4109 Reas Lane Initial Test Failure Rate By Vehicle Model Year For Test Years 1997 - 2000			
Model Year	Initial Tests	Initial Failures	Failure Rate (%)
1976 - 1980	2,783	1,243	44.66
1981 - 1989	28,371	4,604	16.23
1990 - 1995	33,129	1,467	4.43
1996 and newer	9,194	60	0.65

Jeffersonville - 1502 Research Drive
Initial Test Results
1997 - 2000

	Tests	Pass	Failures	Failure Rate (%)
Jeffersonville	97,655	86,155	11,500	11.8



Jeffersonville - 1502 Research Drive
Initial Test Failure Rate
By Vehicle Model Year
For Test Years 1997 - 2000

Model Year	Initial Tests	Initial Failures	Failure Rate (%)
1976 - 1980	3,725	1,704	45.74
1981 - 1989	35,600	7,486	21.03
1990 - 1995	46,513	2,244	4.82
1996 and newer	12,009	92	0.77

ANNUAL TESTING SUMMARY ALL SITES

Northwest Indiana 1997 - 2000 Initial Test Results				
	Tests	Pass	Failures	Failure Rate (%)
Hammond	133,157	115,594	17,563	13.2
Griffith	183,108	164,892	18,216	9.9
Hobart	95,805	85,160	10,645	11.1
Crown Point	109,823	101,308	8,515	7.8
Valparaiso	110,006	101,901	8,105	7.4
Gary	27,182	22,542	4,640	17.1
Portage	15,420	13,966	1,454	9.4

Clark and Floyd Counties 1997 - 2000 Initial Test Results				
	Tests	Pass	Failures	Failure Rate (%)
New Albany	69,290	61,798	7,492	10.8
Jeffersonville	97,655	86,155	11,500	11.8

Pollutant Reductions By Region for Calendar Year 2000

Annual Tailpipe Reductions Northwest Indiana Calendar Year 2000	
HydroCarbons (HC)	305 tons per year
Carbon Monoxide (CO)	3,670 tons per year
Nitrogen Oxides (NOx)	92 tons per year

Annual Tailpipe Reductions Clark and Floyd Counties Calendar Year 2000	
HydroCarbons (HC)	83 tons per year
Carbon Monoxide (CO)	1,151 tons per year
Nitrogen Oxides (NOx)	31 tons per year

REPAIR TECHNICIAN TRAINING AND CERTIFICATION

If a vehicle is emitting more pollution than allowed by law, it means that there is a mechanical or electrical problem with the vehicle that must be identified and repaired. Because vehicle emission control systems are becoming increasingly complicated, repair technicians require specialized training to be able to effectively repair these problems. In order to ensure that repair technicians are well-trained in emission-related repairs, Indiana operates a vehicle repair technician certification program. Through this program, repair technicians receive specialized training in how to diagnose and repair emission-related problems. If a vehicle fails an emission test, a motorist may choose a certified repair technician to repair the vehicle. However, it is not required that a certified repair technician perform the repairs unless the motorist intends to seek a waiver of the emissions test requirement on the vehicle.

Based on guidance from U.S. EPA and in compliance with Indiana law, IDEM set up a program of advanced technical training and certification requirements that must be completed before a repair technician may become an Indiana Certified Emission Repair Technician. The first step in the training process requires a repair technician to pass the Indiana Certified Emission Repair Technician (ICERT) Level 1 Training (also known as FIRST). To prove competency, a repair technician has the option of taking the Indiana placement test for ICERT Level 1 training or of taking ICERT Level 1 training classes. ICERT Level 1 is a review of the principal automotive systems and includes electrical systems, carburetor and injection systems, computer systems and driveability. When a repair technician passes the placement test or completes the ICERT Level 1 training classes, he or she may proceed to the second level of training.

The second level of training is the Indiana Certified Emission Repair Technician Level 2 Training (ICERT2). This training is also called EDGE, which stands for Emission Diagnostician Graduate Education. Any repair technician who wishes to be certified as an Indiana Certified Emission Repair Technician must successfully complete ICERT Level 2 training. This course trains repair technicians to diagnose and repair vehicles that have failed the emissions test. Typically, the course consists of 36 hours of both classroom instruction and “hands on” experience with four to eight hours specifically focusing on Indiana’s emission testing program. Also as part of this training, Envirotest Systems provides a tour of a testing facility so that repair technicians can observe how the emission test is performed on vehicles and to allow the repair technicians to “drive” a vehicle on the dynamometer. Certified independent local trainers can provide both ICERT Level 1 and Level 2 training.

Classroom training is required before a technician may be certified.

There is additional certification required in order to qualify as an Indiana Certified Emissions Repair Technician. A repair technician must posses current certification with the National Institute for Automotive Service Excellence (ASE) as an Advanced Engine Performance (L1) technician. This certification is obtained by taking and passing a test administered by the ASE and is valid for five years. The repair technician must also be professionally engaged in emission/driveability repair and must be gainfully employed at a repair shop to qualify as an Indiana Certified Emissions Repair Technician.

Hands-on training is an integral part of the technician training and certification.

By rule, Indiana requires that an automotive repair shop be certified if it intends to do emission repair work that will qualify for a waiver. In order for a shop to become a Certified Emission Repair Shop, it must employ at least one Certified Emission Repair Technician and possess reference materials appropriate to the vehicles it repairs. The shop must also possess proper equipment in good working order.

Envirotest Systems, in partnership with IDEM, sponsors periodic outreach and support gatherings for certified emission repair technicians. These gatherings, called "Tech Nights", are informal and usually held at one of the emission test sites. One of the functions of these programs is to keep the repair technicians up-to-date with any changes in the operation of the emission testing program. Another function is to provide expert technical information and advice. Guest speakers with specific areas of expertise are invited to speak to the group and show a "hands on" demonstration of their topic. These gatherings provide an opportunity for repair technicians to share information with other repair technicians and with IDEM and Envirotest.

As of June 2001, Indiana has 92 Certified Emission Repair Technicians employed at 72 Indiana Certified Repair Facilities. IDEM audits certified shops periodically with unannounced visits. Certification credentials are maintained for each repair technician and shop and are updated annually.

ON-ROAD REMOTE SENSING CONDUCTED

The remote sensing device is portable and moved to various locations to randomly sample emissions.

Remote Sensing is a program used to measure emissions from a random sample of vehicles as they drive on highways entering and leaving Lake, Porter, Clark and Floyd counties.

U.S. EPA requires that IDEM include Remote Sensing as part of its I/M program. Each year, Indiana must use remote sensing equipment to measure the emissions of at least 0.5% of the registered vehicles in the four I/M counties.

The remote sensing device is a system designed for roadside measurement of vehicle emissions. A vehicle's emissions are measured as it drives by the device which has been set up next to the road. A light beam is projected across the road and reflected back to a receiver which measures the amount of vehicle emissions that interfere with the light beam. The receiver measures tailpipe emission concentrations of carbon monoxide (CO), carbon dioxide (CO_2), hydrocarbons (HC) and nitrogen oxides (NOx). A camera simultaneously captures a video image of the rear of the vehicle and its license plate so the vehicle can be identified by make, model year, and county or state of registration.

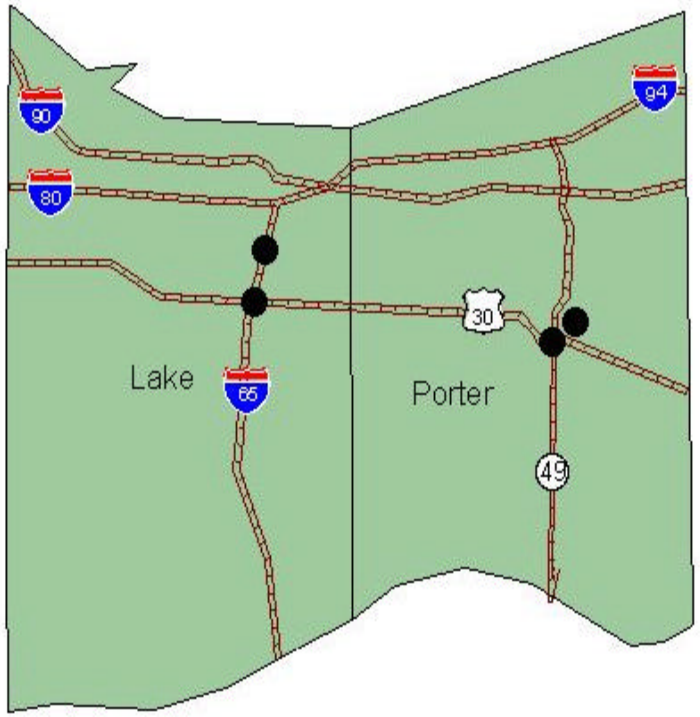
The remote sensing data are used to help identify the benefits of the I/M program, not to penalize motorists. The emission data collected and the make and model year of the vehicle allow analysts to compare the difference in emssions between a group of vehicles that have been through the I/M program and vehicles of the same model year that have not been through the I/M program (because they are not registered in one of the I/M counties).

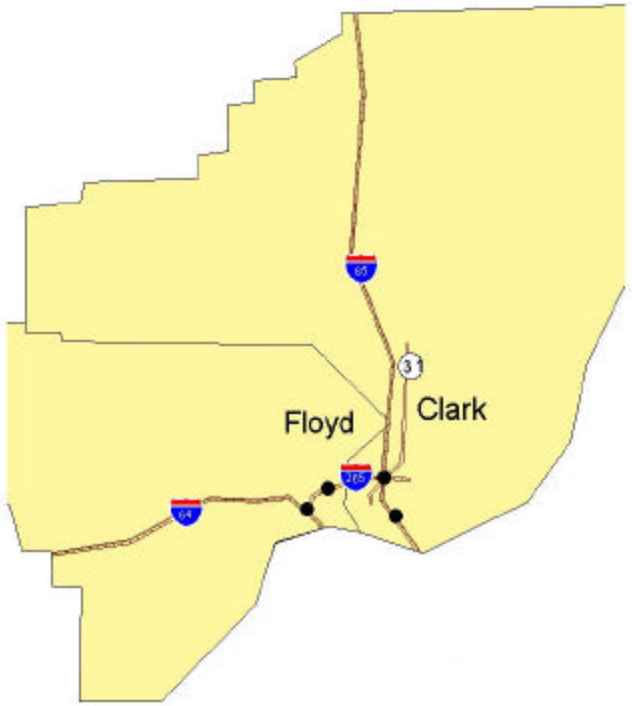
To avoid interference between vehicles, the sensing unit is capable of completing the vehicle emission measurement within 0.6 second. The unit completes all measurements for a vehicle including emissions, speed, acceleration and plate image within one second. The sensing unit takes multiple rapid readings for each vehicle to evaluate whether a valid measurement of a vehicle's exhaust has been achieved and makes correction for changes in background concentrations of emissions.

Remote Sensing data collected has enabled IDEM to determine that vehicles registered in Lake, Porter, Clark and Floyd counties, that have been inspected through the I/M program, emit fewer pollutants than vehicles of the same model year that have not been through emissions testing.

WHERE IS REMOTE SENSING CONDUCTED?

Measurements are taken in several different locations with no one area receiving an undue amount of testing. Site selection is critical to obtaining remote sensing measurements that are representative of typical vehicle operation. Sites are selected in areas where vehicles would be accelerating or driving at a steady speed in a single lane and where there is adequate median space for the sensing equipment to be deployed without disrupting traffic flow. There also must be adequate traffic volume with the potential for a good mix of vehicles registered in the test and non-test counties. Data were collected four times from 1998 - 2000 from nine locations with five sites in the Northern I/M area and four sites in the Southern I/M area.





WHAT WERE THE RESUL TS?

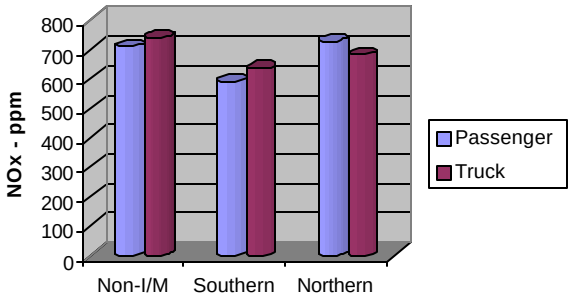
The number of light and medium duty vehicles registered is approximately 400,000 in the northern I/M area (Lake and Porter counties) and approximately 120,000 in the southern I/M area (Clark and Floyd counties). The requirement to test a 0.5% sample of subject vehicles requires approximately 2,600 measurements per year.

In total, 20,643 measurements were made from June 8 through June 19, 1998, and 30,736 measurements from September 13 through September 24, 1999. A large number of sample measurements is necessary to ensure at least a 0.5% of the measurements are from vehicles registered in the nonattainment areas. The data on the following page illustrates that vehicles registered in the I/M areas had lower HC, CO and NO_X emissions than those registered outside the I/M program counties.

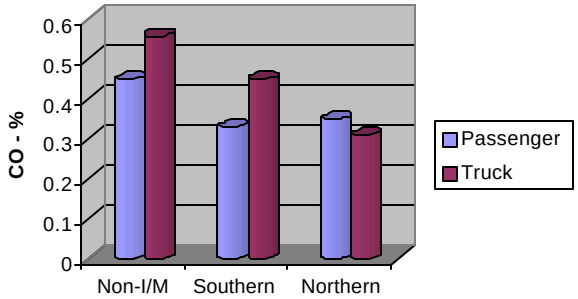
Additional data comparing model years, cars and trucks may be referenced in the Appendix on pages 35 and 36.

To obtain these results, remote sensing measurements were sorted according to the I/M area and the vehicle's county of registration. To eliminate the effects of differences in the age distribution between vehicles registered in the northern, southern and non-I/M areas, emissions were weighted according to the model year distribution of the combined sample.

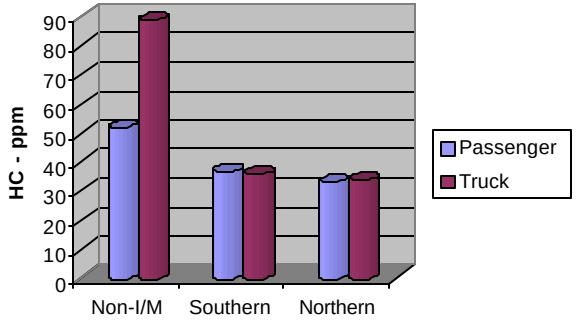
1998 Average Fleet NOx Emissions



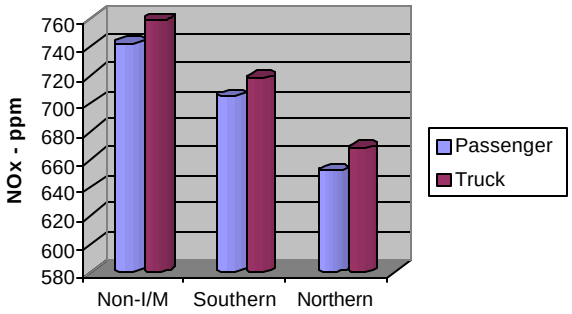
1998 Average Fleet CO Emissions



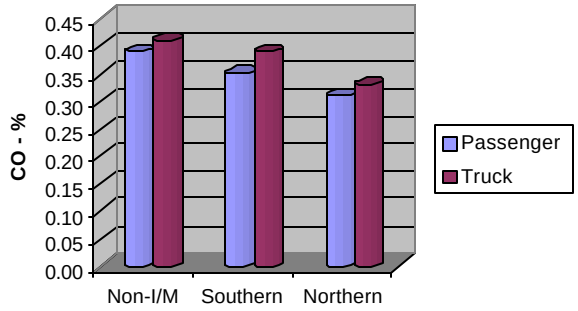
1998 Average Fleet HC Emissions



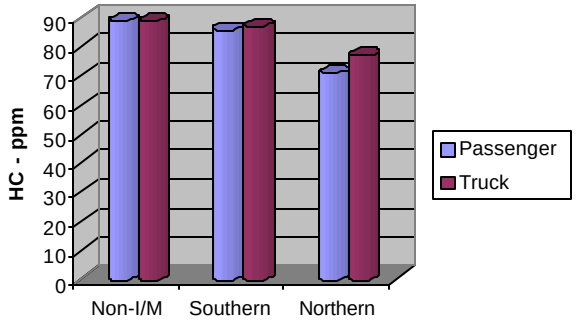
1999 Average Fleet NOx Emissions



1999 Average Fleet CO Emissions



1999 Average Fleet HC Emissions



REFEREE PROGRAM

In 1999, a “referee” program was implemented at the two southern Indiana Clean Air Car Check stations for vehicles that fail the test multiple times. The referee evaluates the vehicle and the type of repairs or modifications that have been made since its initial test failure. The referee determines whether further repairs will be able to prevent the excess emissions. If the referee determines the vehicle will benefit from additional repairs, the referee prepares a written description of the repairs for the motorist to present to a repair shop. The referee may also determine that further repairs to a given vehicle are not economically feasible and that the vehicle should receive a waiver. In this case, the referee notifies Envirotest Systems to grant the vehicle a waiver and provide the appropriate paperwork to the motorist.

The purpose of the referee program is to reduce the number of vehicles receiving more than four retests, which in turn reduces testing and wait time for everyone. After a vehicle has received an initial emission test failure, that vehicle may be retested up to four additional times. A vehicle may not be retested a fifth time until the motorist has presented the vehicle for evaluation to the emission testing program referee. There is no charge to the motorist for the referee’s evaluation.

The referee program has been effective in reducing the number of retests. The southern Indiana stations have experienced an increase in the percentage of vehicles that pass an emission test after seeing the referee from 37.2% in 1999 to 45.3% in 2000. A similar program may be implemented for the northern Indiana stations if funding becomes available.

The referee checks the vehicle for problems.

QUALITY ASSURANCE

Quality assurance is a priority at all of the Clean Air Car Check stations. All Clean Air Car Check sites use the same type of test equipment to test each vehicle. The type of emission test used in Indiana is an enhanced transient test called IM93. The IM93 uses a constant volume sampling system that gathers all of the emissions from a vehicle and measures them on a second by second basis as the vehicle accelerates and decelerates on a dynamometer that is designed to apply the proper amount of resistance to simulate actual driving conditions.

The results from this type of test are given in grams per mile, which is an actual weight amount of the pollutants that can be used to determine how much pollution is going into the atmosphere from each vehicle. The vehicle is driven on the dynamometer for 93 seconds in the IM93. This test uses the data collected from all 93 seconds of the test procedure. If a vehicle fails during the first 93 seconds, it is immediately and automatically tested a second time.

Indiana tests vehicles that are model year 1976 and newer and exempts the most recent four model years. Ninety-five percent of the vehicles tested are 1981 and newer. The remaining five percent of vehicles tested are model year 1976 through 1980. These older vehicles receive a different type of test known as a BAR-90 single speed idle test.

In this type of test a probe is inserted into the tailpipe of a vehicle to measure the concentration of pollutant gases in the exhaust stream. The number of vehicles that receive the idle test is decreasing each year.

Every test site is equipped with an adjustable four-wheel drive dynamometer in one lane. The purpose of the four-wheel drive testing system is to enable several different types of vehicles to receive the IM93 emission test. The groups of vehicles that must be tested on this lane are: full-time four-wheel drive vehicles, all-wheel drive vehicles, and traction control vehicles with no disable mechanism.

IDEM is responsible for maintaining the quality assurance program. IDEM regularly reviews analyzer, dynamometer, and constant volume sampling system calibration data at the test sites. IDEM staff conduct regular gas challenge audits on all IM93 analyzers at all test sites.

Each gas challenge audit consists of introducing known concentrations of carbon monoxide, carbon dioxide, hydrocarbons, and oxides of nitrogen into the IM93 analyzers and checking the analyzer response.

If the analyzer response is more than four percent different than the concentration of the test gas, the analyzer fails the audit and is taken out of service. IDEM and Envirotest Systems review results of daily automatic analyzer calibration checks and periodic analyzer zero/span checks available via live computer link with the system host computer in Merrillville, Indiana.

In 1997, the first year of enhanced emission testing in Indiana, a total of thirty-seven gas challenge audits were conducted on IM93 analyzers at both the Northwest and the Southern Indiana vehicle emission testing facilities. IDEM and Envirotest Systems take the necessary steps to correct any problems revealed during the audits. Envirotest Systems has a rigorous quality assurance, quality control, and preventive maintenance program that assures the accuracy of vehicle emission tests performed at the Clean Air Car Check facilities. Weekly visits by state inspectors to all nine test sites ensure that procedures are being followed.

APPENDIX

REMOTE SENSING RESULTS

To view the difference between vehicles in different age groups, vehicles were grouped into five-year model ranges. Model year ranges were used because of the small sample sizes for many individual model years.

The charts on the right illustrate the sample counts and the hydrocarbon emissions from vehicles registered in I/M and non-I/M counties.

The charts on page 36 illustrate carbon monoxide and nitrogen oxide emissions from vehicles registered in the I/M counties and non-I/M counties.

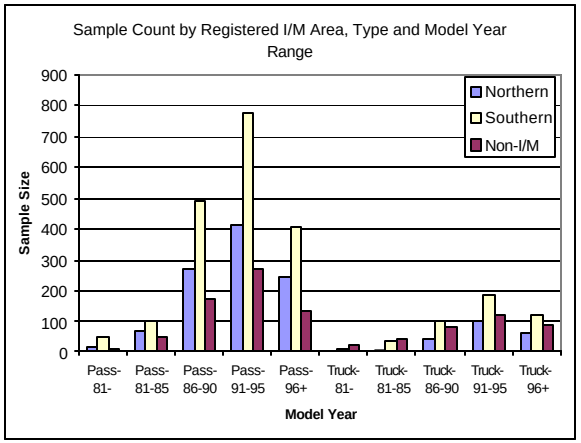


Figure 1 - Sample Counts

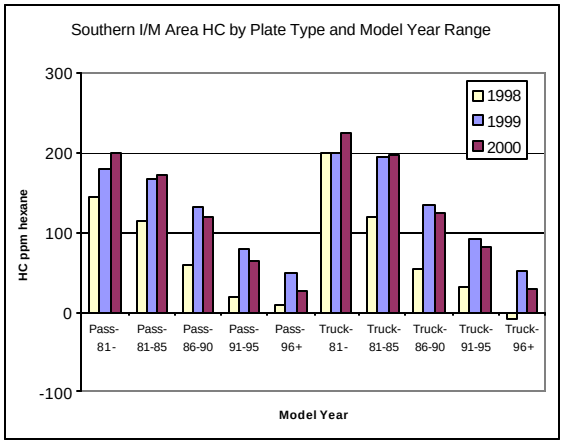


Figure 2B - Southern HC Emissions

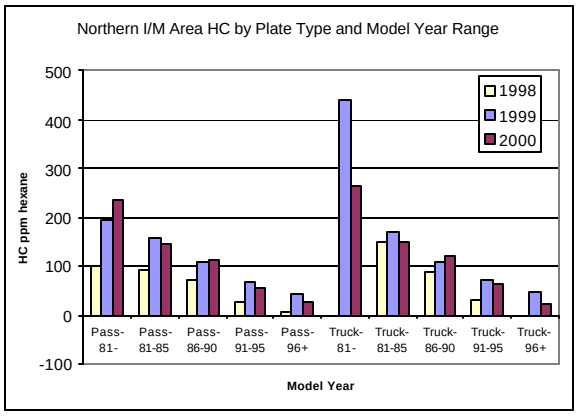


Figure 2A - Northern HC Emissions

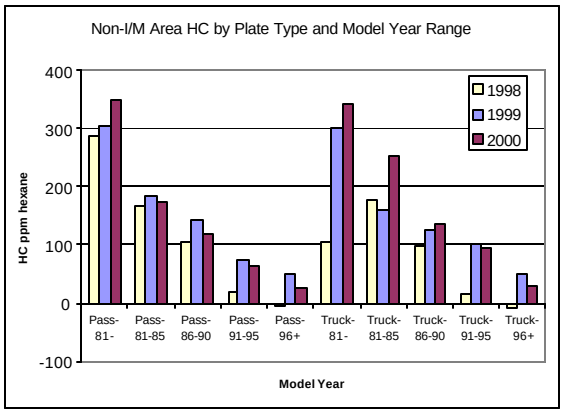


Figure 2C - Non I/M HC Emissions

Figure 1 shows the number of vehicles in each group. Figures 2 through 4 show the average HC, CO and NOx measurements for each group by plate type and model year.

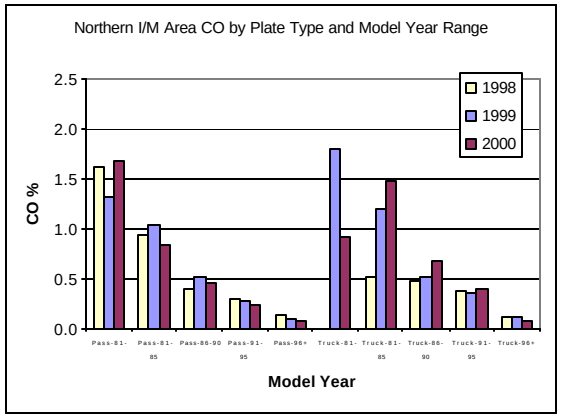


Figure 3A- Northern CO Emissions by Plate Type and Model Year

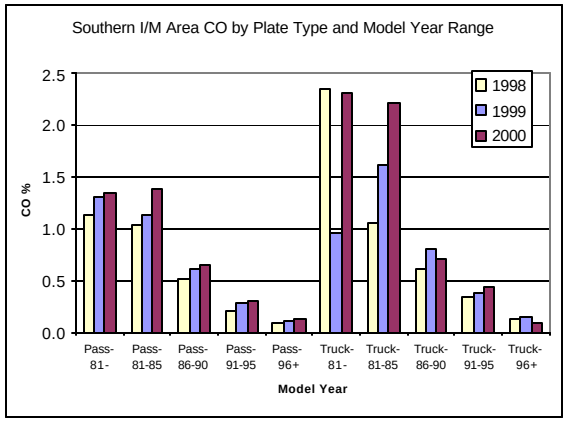


Figure 3B- Southern CO Emissions by Plate Type and Model Year

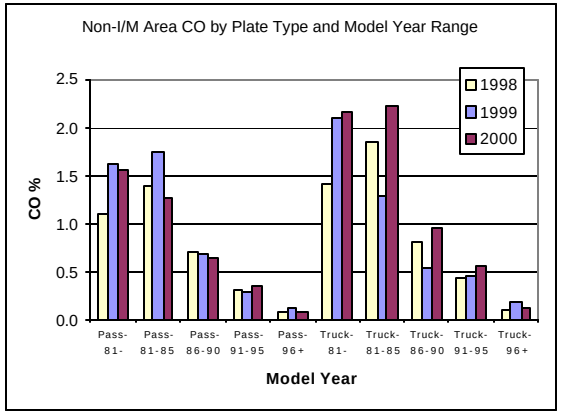


Figure 3C- Non-I/M CO Emissions by Plate Type and Model Year

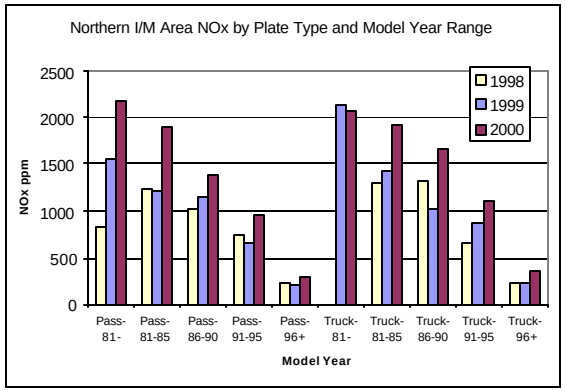


Figure 4A - Northern NO_x Emissions by Plate Type and Model Year

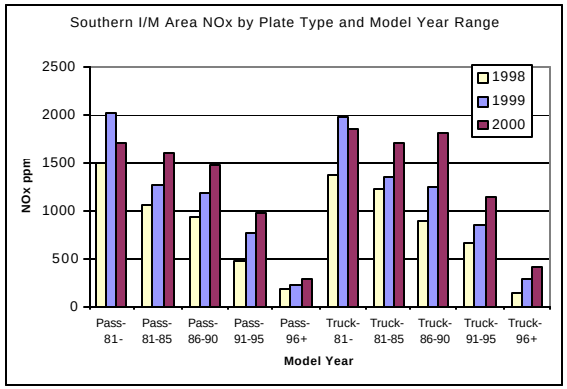


Figure 4B - Southern NO_x Emissions by Plate Type and Model Year

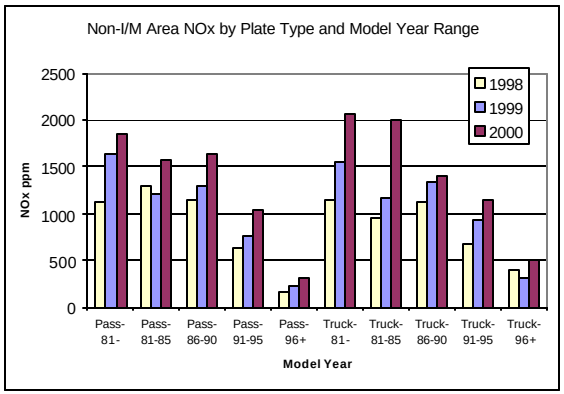


Figure 4C - Non-I/M NO_x Emissions by Plate Type and Model Year